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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,234	10/23/2003	Mark Hollatz	1406/175	8395
25297	7590	06/01/2005	EXAMINER	
JENKINS, WILSON & TAYLOR, P. A. 3100 TOWER BLVD SUITE 1400 DURHAM, NC 27707			VINH, LAN	
			ART UNIT	PAPER NUMBER
			1765	

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/692,234

Applicant(s)

HOLLATZ ET AL.

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 112103.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang et al (US 6,043,133) in view of Hsu (US 5,420,067)

Jang discloses a method of photo alignment for STI chemical mechanical polishing for the planarization of a semiconductor structure having a substrate 10, in which plurality of substructures are provided, the substructures having first substructure, which has planar regions and first trench regions, layer 38 to be planarized being applied over the semiconductor structure, which layer has corresponding first depressions above the first trench regions of the first substructure (fig. 3 ). The method comprising the following steps:

preplanarization of the layer to be planarized by etching step using preplanarization

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mask 42B (col 7, lines 53-55)

subsequent planarization of the layer to be planarized by chemical mechanical polishing step (col 8, lines 1-4)

by using the preplanarization mask provision is made of a first region on the layer to be planarized above the first substructure, which region has a predetermined masked and nonmasked sections (fig. 4)

masked and nonmasked sections 42A being arranged in such a way that they respectively cover both first trench regions and planar regions on the substrate (fig. 2c)

supporting structure for the chemical mechanical polishing step, which corresponds the masked sections , being created by the etching step using the preplanarization mask 42 A (fig. 3)

the substructures having a second substructure, which comprises second trench regions, the layer to be planarized 38 having corresponding second depressions above the second trench regions 34 of the second substructure, and that, by means of the preplanarization mask, provision is made of second region on the layer to be planarized above the second substructure, the region 34 is masked throughout (fig. 4)

the first trench regions are device areas/capacitor trenches and the second trench regions are STI trenches (col 6, lines 64-66)

providing patterned hard mask 22 on then surface of the substrate, the hard mask being opened at the first trench regions and at the second trench regions (col 3, lines 32-33; fig. 2c)

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the arrangement of the nonmasked sections have symmetry, the characteristic lengths of the nonmasked sections being a multiple of the characteristic structure lengths of the underlying first trench regions (fig. 4)

planarizing the layer 38 by chemical mechanical polishing step as far as the surface of the hard mask (col 8, lines 1-4; fig. 6)

Unlike the instant claimed inventions as per claims 1, 5-6, Jang fails to specifically disclose using a regular grid of masked and unmasked section having regular hole structure/strip structure

Hsu discloses a method for fabricating substrate-microns trench comprises the step of forming trenches/via using a template/ grid of masked and unmasked section having regular hole structure/strip structure (col 5, lines 49-52; fig. 7a)

Since both Jang and Hsu are directed to a step of forming trenches, one skilled in the art at the time the invention was made would have found it obvious to modify Jang by using a template/ grid of masked and unmasked section having regular hole structure as per Hsu because Hsu discloses that the template can be reused on a new substrate thereby increasing the efficiency of the process and reducing cost (col 5, lines 55-58)

Regarding claim 2, second region extends beyond the second trench regions into adjoining substructures 35 (fig. 3)

Regarding claim 3, wherein the substructures have third substructures 14, which comprise planar regions, and in that, by means of the preplanarization mask, provision is made of third regions on the layer to be planarized above the third substructures, which regions are nonmasked throughout (fig. 3)

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Regarding claim 4, Jang discloses the step of forming the photoresist mask 42 on the semiconductor structure (col 5, lines 49-50)

***Conclusion***

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LV  
May 26, 2004